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See application file for complete search history.

(56) References Cited

U.S. PATENT DOCUMENTS

5,937,384	Δ *	8/1999	Huang G06K 9/6297
3,237,304	7 x	0/1///	704/251
C 407 521	D1 #	11/2002	
6,487,531	BI *	11/2002	Tosaya G10L 15/20
			704/223
7,181,391	B1 *	2/2007	Jia G10L 15/18
			704/231
8,364,486	B2*	1/2013	Basir G10L 15/02
			704/254
9,564,128	R2*	2/2017	Park G10L 15/24
9,977,496		5/2018	Maltz G06F 3/013
9,984,683		5/2018	Li
, ,			
2006/0074656	A1	4/2006	Mathias G10L 15/063
			704/243
2007/0106501	A1*	5/2007	Morita G06F 3/015
			704/200
2008/0288022	A1*	11/2008	Van der Borght H04R 25/43
			607/57
2009/0010456	A1*	1/2009	Goldstein H04R 25/02
2005/0010450	411	1/2007	381/110
			381/110

(Continued)

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(57) ABSTRACT

A system for subvocalized speech recognition includes a plurality of sensors, a controller and a processor. The sensors are coupled to a near-eye display (NED) and configured to capture non-audible and subvocalized commands provided by a user wearing the NED. The controller interfaced with the plurality of sensors is configured to combine data acquired by each of the plurality of sensors. The processor coupled to the controller is configured to extract one or more features from the combined data, compare the one or more extracted features with a pre-determined set of commands, and determine a command of the user based on the comparison.

18 Claims, 4 Drawing Sheets

